

CLAIMS

What is claimed is:

1           1.     A system for optically imaging, the system comprising:  
2                 (a)     an array of cells for producing an electrical charge in response  
3     to photon stimulation;  
4                 (b)     a charge shift register configured to receive the electrical  
5     charge produced by each cell in the array and to sequentially output the electrical  
6     charge of each cell;  
7                 (c)     at least two charge sensing nodes for accumulating charge  
8     readable as a voltage; and,  
9                 (d)     a charge demultiplexor configured to receive the output of the  
10    charge shift register and to selectively distribute the output to each of the at least two  
11    charge sensing nodes.

1           2.     The system of claim 1 wherein the array of cells includes a charge  
2     coupled device array.

1           3.     The system of claim 1 further including at least one output buffer  
2     configured to receive the voltage of each of the at least two charge sensing nodes.

1           4.     The system of claim 1 further including at least one amplifier  
2     configured to amplify the voltage from the at least two charge sensing nodes.

1           5.     The system of claim 1 further including at least one analog to digital  
2     converter configured to convert the voltage from the at least two charge sensing  
3     nodes into a digital signal.

1           6.     A method for producing a voltage signal segmented to represent an  
2     output of an array of cells that produce a cell electrical charge in response to photon  
3     stimulation, the method comprising:

4                 (a)     receiving each of the cell electrical charges from the cells in a  
5     charge shift register;

6                 (b)     sequentially outputting the cell electrical charges from the  
7     charge shift register to a charge demultiplexor;

8                 (c)     the charge demultiplexor selectively distributing the sequential  
9     cell charges to one of at least two charge sensing nodes; and,

10                (d)     sequentially reading a voltage produced by the cell charges in  
11     at least one of the at least two charge sensing nodes.

1           7.     The method of claim 6 wherein the charge demultiplexor selectively  
2     distributing the sequential cell charges to one of at least two charge sensing nodes  
3     includes the charge demultiplexor distributing one cell charge to each of the at least  
4     two charge sensing nodes.

1           8.     The method of claim 6 wherein the charge demultiplexor selectively  
2     distributing the sequential cell charges to one of at least two charge sensing nodes  
3     includes the charge demultiplexor distributing multiple cell charges to each of the at  
4     least two charge sensing nodes.

1           9.     A system for producing a voltage signal segmented to represent an  
2     output of an array of cells that produce an electrical charge in response to photon  
3     stimulation, the system comprising:

4                 (a)     a charge shift register configured to sequentially receive the  
5     charge from each cell;

6                 (b)     at least two charge sensing nodes configured to accumulate  
7     charge and output a voltage signal;

8 (c) a charge demultiplexor configured to sequentially distribute  
9 each charge from the charge shift register to one of the at least two charge sensing  
10 nodes.

1 10. The system of claim 9 further including at least one output buffer  
2 configured to receive the voltage of each of the at least two charge sensing nodes.

1 11. The system of claim 9 further including at least one amplifier  
2 configured to receive and amplify the voltage of each of the at least two charge  
3 sensing nodes.

1 12. The system of claim 9 further including an analog to digital converter  
2 configured to convert the voltage from the at least two charge sensing nodes into a  
3 digital signal.

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